d. Installed to permit access to areas requiring cleaning; or

e. Sealed to adjoining equipment or adjacent walls or ceilings unless sufficient space is provided for easy cleaning between, behind, and above each unit of fixed equipment (see NSF's *Manual on Sanitation Aspects of Installation of Food Service Equipment*).

4–23. Aisles and Working Spaces

Aisles and working spaces between units of equipment and walls will be unobstructed and of sufficient width to permit employees to perform their duties readily without contamination of food or food-contact surfaces by clothing or other personal contact. All easily moveable storage equipment such as pallets, racks, and dollies will be positioned to provide accessibility to working areas.

Section VI. EQUIPMENT AND UTENSIL CLEANING AND SANITIZING

4–24. Cleaning Frequency

a. Tableware will be washed, rinsed, and sanitized after each use.

b. Kitchenware and food-contact surfaces of equipment and other utensils will be washed, rinsed, and sanitized after each period of use and after any interruption of processing which would allow the multiplication of bacteria to harmful quantities. Items of significance include cutting boards, knives, slicers, mixers, grinders, food-preparation sinks, and frozen dessert machines.

c. Where equipment and utensils are used for the preparation of PHFs on a continuous or production-line basis, utensils and food-contact surfaces of equipment will be washed, rinsed, and sanitized at intervals throughout the work period. This schedule will be approved by the IMA based on food temperature, type of food, and amount of food debris accumulation. A copy of the approved cleaning schedule will be posted at the worksite.

d. Equipment and food-contact surfaces that have touched any raw food product must be cleaned and sanitized thoroughly before touching any other food.

e. The food-contact surfaces of grills, griddles, and similar cooking devices, and the cavities and door seals of microwave ovens will be cleaned at least once per operating shift. This requirement does not apply to equipment protected from contamination and not used or otherwise soiled. The food-contact surfaces of all cooking equipment will be kept free of encrusted grease, food debris, and other accumulated soil.

f. Deep fat fryers will be drained, the fat strained, and internal surfaces wiped clean of soil and debris at the end of each day's use. External surfaces should be cleaned daily. Deep fat fryers will be covered with a tight closing lid when not in use.

g. Nonfood-contact surfaces of equipment will be cleaned as often as necessary to keep the equipment free of accumulation of dust, dirt, food particles, and other debris.

4–25. Wiping Cloths

Sponges and sponge-type cloths are prohibited for use in food service facilities. Single-use paper towels or disposable cloths are preferred to reusable wiping cloths. If reusable wiping cloths are used, the following measures are required:

a. Cloths used for wiping food spills on tableware, such as plates or bowls being served to the consumer, will be clean, dry, and used for no other purpose.

b. Moist clean cloths will be used for wiping food spills on kitchenware and food-contact surfaces of equipment and for other purposes. These cloths will be rinsed frequently in a sanitizing solution, and will be stored in a sanitizing solution between uses.

c. Cloths used for cleaning nonfood-contact surfaces of equipment such as counters, dining table tops, and shelves will be kept clean and rinsed as specified in paragraph *b*, and used for no other purpose.

4–26. Steel Wool

Steel wool and steel wool pads will not be used for cleaning food-contact surfaces in any food service operation within the U.S. Army. Use of woven brass or plastic pads is allowed for scrubbing pots and pans provided the pads are cleaned and sanitized after each cleanup period.

4–27. Detergents and Sanitizers

Detergents and sanitizers will be used per the manufacturer's label instructions and only for those applications specified on the label. Detergents and sanitizers will be listed in 21 CFR 178 as approved for the intended use. Sanitizers used will be listed as not requiring a potable water rinse and also be registered with the EPA for food service use.

4–28. Manual Cleaning and Sanitizing

Guidance on manual cleaning and sanitizing is contained in MIL–HDBK–740. MIL–HDBK–740 is a general reference. Disregard pages 1 through 3, and supplement the guidance given with FM 10–23. Where conflicts between instructions in

MIL–HDBK–740 and this bulletin exist, this bulletin will be followed.

a. For manual washing, rinsing, and sanitizing of utensils and equipment, a sink with not fewer than three compartments will be provided and used. Sink compartments will be large enough to permit the accommodation of the equipment and utensils. In new construction or renovation, each compartment of the sink will be individually supplied with adequate hot and cold potable running water.

b. Fixed equipment and utensils, and equipment too large to be cleaned in sink compartments, will be preflushed or prescraped, washed with hot detergent solution, rinsed, and sanitized per paragraph *e* below.

c. Drainboards or easily movable dish tables of adequate size will be—

(1) Provided for proper handling of soiled utensils prior to washing and for cleaned utensils following sanitizing.

(2) Located so not to interfere with the proper use of the dishwashing facilities.

d. Except for fixed equipment and utensils too large to be cleaned in sink compartments, manual washing, rinsing, and sanitizing will be conducted in the following sequence:

(1) Sinks will be cleaned prior to use.

(2) Equipment and utensils will be preflushed or prescraped and, when necessary, presoaked to remove gross food particles and soil. The preflush water temperature should not exceed 80°F (27°C).

(3) Equipment and utensils will be thoroughly washed in the first compartment with a detergent solution that is kept clean and has a water temperature between 110–120°F (43–49°C).

(4) Equipment and utensils will be rinsed free of detergent and abrasives with hot (120–140°F) (49–60°C) clean water in the second compartment.

(5) Equipment and utensils will be sanitized in the third compartment according to one of the methods outlined in paragraph *e* below.

e. The food-contact surfaces of all equipment and utensils will be sanitized by—

(1) Immersion for at least 1/2 minute in clean, hot water at a temperature of at least 170°F (77°C); or

(2) Immersion for at least 1 minute in a clean solution containing at least 50 ppm of available chlorine [1] as a hypochlorite at a temperature of at least 75°F (24°C), but not more than 110°F (43°C); or

(3) Immersion for at least 1 minute in a clean solution containing at least 12.5 ppm of available iodine [2] and having a pH not higher than 5.0 at a temperature of at least 75°F (24°C), but not more than 110°F (43°C); or

(4) Immersion in a clean solution containing any other chemical sanitizing agent allowed under 21 CFR 178.1010 that provides the equivalent bactericidal effect of a solution containing at least 50 ppm of available chlorine as a hypochlorite at a temperature of at least 75°F (24°C) for 1 minute (certain chemical disinfectants have maximum safe use temperatures noted on label instructions that will be followed); or

(5) Treatment with steam free from materials or additives other than those specified in 21 CFR 173.310 in the case of equipment too large to sanitize by immersion, but in which steam can be confined; or

(6) Rinsing, spraying, or swabbing the equipment or utensil with a chemical sanitizing solution of at least twice the strength required for that solution when used as an immersion sanitizer per (2), (3), or (4) above.

f. When hot water is used for sanitizing, the following facilities will be provided and used:

(1) An integral heating device or fixture installed in, on, or under the sanitizing compartment of the sink capable of maintaining the water at a temperature of at least 170°F (77°C).

(2) A numerically scaled indicating thermometer, accurate to +3°F (1.7°C), easily calibrated, convenient to the sink for frequent checks of water temperature.

(3) Dish baskets of such size and design to permit complete immersion of the tableware, kitchenware, and equipment in the hot water.

g. When chemicals are used for sanitizing, they will be used per labeled instructions and will not have concentrations higher than the maximum permitted under 21 CFR 178.1010. A test kit or other device that accurately measures the ppm concentration of the solution will be on hand at the facility and used by the food service personnel to monitor the sanitizer concentration.

4–29. Mechanical Cleaning and Sanitizing

Basic guidance on mechanical cleaning and sanitizing is contained in MIL–HDBK–740, and NSF pamphlet, *Recommended Field Evaluation Procedures for Spray-Type Dishwashing Machines.*

a. Cleaning and sanitizing may be accomplished by use of spray-type or immersion dishwashing

[1] One tbsp (0.5 oz) of household type chlorine bleach in 4 gallons of water provides a starting solution of approximately 50 ppm available chlorine. When chlorine bleach is used as a sanitizer, the concentration of available chlorine will be checked frequently with a test kit or chlorine test paper.

[2] Iodine solutions are preferred because of lower volatility, and visible evidence of presence of the active ingredient in solution. (Iodine concentration test strips or papers are available from commerical sources.)

154-505 O - 94 - 3

machines, or by any other type of machine or device that meets the NSF standards for mechanical dish or pot and pan washing equipment. Local modification of such equipment is prohibited because it may invalidate manufacturers' warranty and NSF listing. Machines and devices will be operated per manufacturer's instructions, and utensils and equipment placed in the machine will be exposed to all dishwashing cycles. Automatic detergent dispensers, wetting agent dispensers, and liquid sanitizer injectors, where provided, will meet the requirements of NSF Standard 29 and be properly installed and maintained.

b. The pressure of the final rinse water supplied to spray-type dishwashing machines will be not less than 15 nor more than 25 pounds per square inch measured in the water line immediately adjacent to the final rinse control valve. A 1/4–inch iron pipe size (IPS) valve will be provided immediately upstream from the final rinse control valve to permit checking the flow pressure of the final rinse water by Directorate of Engineering and Housing personnel.

c. Machine or water line-mounted numerically scaled indicating thermometers, accurate to ±3°F (1.7°C), and easily calibrated, will be provided to indicate the temperature of the water in each tank of the machine and the temperature of the final rinse water as it enters the manifold.

d. Checking temperatures in dishwashing machines will be accomplished using the guidelines contained in NSF Standard 3 and NSF pamphlet *Recommended Field Evaluation Procedures for Spray-Type Dishwashing Machines.*

e. Rinse water tanks will be protected by baffles, curtains, or other effective means to minimize the entry of wash water into the rinse water. Conveyors in dishwashing machines will be accurately timed to assure proper exposure time in wash and rinse cycles per manufacturers' specifications listed on the machine data plate.

f. Drainboards will be provided and be of adequate size for the proper handling of soiled utensils prior to washing and for drying of cleaned utensils after sanitizing.

g. Equipment and utensils will be flushed or scraped and, when necessary, soaked to remove gross food particles and soil prior to being washed in a dishwashing machine unless a prewash cycle is a part of the dishwashing machine operation. Equipment and utensils will be placed in racks, trays, or baskets, or on conveyors in a way that food-contact surfaces are exposed to the unobstructed application of detergent wash and clean rinse waters and that permits free draining.

h. Machines using chemicals for sanitizing may be used provided that they meet requirements of NSF Standard 3 for chemical sanitizing, and—

(1) The temperature of the wash water is not less than 120°F (49°C).

(2) The wash water is kept clean.

(3) Chemicals added for sanitizing purposes are automatically dispensed and an alarm system is provided to indicate that the chemical feed has been interrupted.

(4) Utensils and equipment are exposed to the final chemical sanitizing rinse per the manufacturers' specifications for time and concentration as listed on the machine data plate.

(5) The chemical sanitizing rinse water temperature is maintained within the temperature range specified by the machine's manufacturer.

(6) Chemical sanitizers used will meet the requirements of 21 CFR 178.1010 and be approved by the manufacturer for use with the machine.

(7) A test kit or other device that accurately measures the ppm concentration of the sanitizing solution will be available and used.

i. Machines using hot water for sanitizing may be used provided they meet applicable NSF standards, and the wash water and pumped rinse water are kept clean and maintained at the temperatures listed in NSF Standard 3, as indicated on the machine data plate, or as listed in the NSF annual listing, *Food Service Equipment and Related Products, Components and Materials.*

j. All dishwashing machines will be thoroughly cleaned at least daily and will be operated and serviced as specified by the manufacturer.

4–30. Drying

After sanitizing, all equipment and utensils will be completely air dried. Appropriate drying area will be provided for the racks coming out of the dishwashing machine to permit air drying and to prevent recontamination of the clean items. The use of dish towels is prohibited.

4–31. Emergency Procedures

When requirements for washing and sanitizing utensils as specified in this bulletin cannot be met, single-service utensils will be used. An adequate supply of liquid concentrate chemical sanitizers meeting the provisions of 21 CFR 178.1010 will be maintained at all food service facilities to meet chemical sanitizing requirements and serve as a backup sanitizing system where hot water is used as the primary sanitizing system. Commercially available products that are EPA-registered and labeled for use on food-contact surfaces will be procured to meet this requirement in garrison-type operations. Because of increased costs and limited shelf-life when compared with liquid commercial

concentrate products, Disinfectant, Food Service (NSN 6840–00–810–6396) should be used only for field operations. All sanitizers and disinfectants will be used per labeled instructions.

Section VII. EQUIPMENT AND UTENSIL HANDLING AND STORAGE

4–32. Handling

Cleaned and sanitized equipment and utensils will be handled in such a manner that protects them from contamination. Spoons, knives, and forks will be touched only by their handles. Cups, glasses, bowls, plates, and similar items will be handled without skin contact with inside surfaces or surfaces that contact the user's mouth.

4–33. Storage

a. Cleaned and sanitized utensils and equipment will be stored at least 6 inches (15 cm) above the floor in a clean, dry location in a way that protects them from splash, dust, and other possible sources of contamination. The food-contact surfaces of fixed equipment will also be protected from contamination. Equipment and utensils will not be placed under exposed sewer lines or water lines, except for automatic fire protection sprinkler heads.

b. Utensils will be air dried before being stored or will be stored in a self-draining position.

c. Glasses and cups will be stored inverted. Other stored utensils, plates, saucers, and bowls will be covered or inverted to protect them from recontamination. Facilities for the storage of knives, forks, and spoons will be designed and used to present the handle to the employee or consumer. Unless clean tableware is prewrapped, holders for knives, forks, and spoons at self-service locations will protect these articles from recontamination and present the handle of the utensil to the consumer.

4–34. Single-service Articles

a. Single-service articles will be stored at least 6 inches (15 cm) above the floor in closed cartons or containers that protect them from contamination.

b. Single-service articles will be handled and dispensed in a manner that prevents contamination of surfaces that may come in contact with food.

c. Single-service knives, forks, and spoons packaged in bulk will be inserted into holders or be wrapped by employees who have washed their hands immediately prior to sorting or wrapping the utensils. Unless single-service knives, forks, and spoons are prewrapped or prepackaged, holders will be provided to protect these items from contamination.

d. Straws will be individually packaged or will be dispensed in a sanitary manner.

e. Single-service articles will not be reused.

4–35. Prohibited Storage Area

The storage of food service equipment, utensils, or single-service articles in toilet rooms, vestibules, or utility rooms is prohibited.

Section VIII. MAINTENANCE AND REPLACEMENT

4–36. Requirements

a. Food service equipment will be maintained and replaced per TM 10–415 and manufacturer's guidance. Equipment will be replaced at the interval specified in applicable supply bulletins to facilitate continued optimal service or when continued use of such equipment is deemed by the IMA to be hazardous to health.

b. Food service utensils, including tableware, will be replaced when chipped, cracked, gouged or broken, or when continued use of such utensils is deemed by the IMA to be hazardous to health.

c. Existing serviceable non-NSF listed equipment that does not present a public health hazard may be authorized by the IMA for continued use.

4–37. Standards

All new equipment and utensils will meet NSF standards (para 4–1).